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ABSTRACT

This study explores the effect of decreasing affordability of college education on the number and racial and ethnic mix of students attending public higher education. Review and discussion of available data from many studies finds that those who can tolerate the expense of foregoing wages while they attend college, are not particularly sensitive to tuition increases. These who are excluded from college education are not affected by the costs of attending but by the opportunity costs of not working for the 4 or more years necessary to complete a degree. Despite human capital theory which holds that the rational person will invest in higher education to the extent that the increased earning later will cover the costs of attending, actual student behavior indicates that the foregone wages are an insurmountable barrier to participation for students from low income families. Thus the study concludes that tuition policy is not likely to be a panacea to the pressure on higher education to fundamentally restructure its costs in the future. Conclusions are illustrated by four tables and two charts. Contains 22 references. (JB)

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The Role of Opportunity Cost in Access to Four Year Public Higher Education

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Widely accessible higher education is one of the critical elements of a "high skill/high wage" economy for the United States. But many factors are combining to work against the availability of higher education to more and more Americans. Family incomes declined in real terms for 60% of American families in the period 1979 to 1989, and poverty rates averaged 13.6% over the decade (Mishel and Bernstein 1993). Poverty rates were particularly acute among minorities: 32.7% of blacks and 28.7% of Hispanics were below the poverty line in 1991. In that year, more than one out of every five children was poor, and over half (51.7%) of black children were poor. For low and middle income families, public higher education became "considerably *less* affordable" in the 1980's (Mumper 1993), and this trend is likely to accelerate in the 1990's, as public institutions of higher education charge higher, sometimes much higher, tuition (Daener 1993).

In addition to the alarming implications for social equity which this trend represents, it also is likely to have an effect on participation rates and enrollments in institutions of higher education. While efforts at predicting enrollments have been notoriously inaccurate in the past, it is nonetheless important to consider what effect the decreasing affordablity of college may have on both the numbers and racial/ethnic mix of students who can attend public higher education. If this effect is seen to be contrary to good public policy, some policy interventions may suggest themselves.

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Enrollment Projections

Enrollment growth in the post-war period has been nothing short of spectacular (see Chart 1), and educational attainment reflected this growth: the percentage of those 25-29 who had finished four or more years of college increased from 6% in 1940 to 23% in 1988 (Clotfelter et al. 1991, 58). The history of enrollment forecasting has, however, been one of dismal failure (see Clotfelter et al. 1991; 23-24). The planners of the GI Bill missed by a factor of ten the numbers of veterans who would take advantage of this program; a careful study in 1969 (Froomkin) forecast 10,338,000 degree seeking students for the year 1976; instead, there were nearly 1 million more (Gerald and Hussar 1991, 11) by that time. Nearly universal prediction of decreasing enrollment - based on declining numbers of 18-24 year-olds - were made for the 1980's (see Carnegie 1980, for example); instead, enrollments increased as college-going rates increased for all age groups, especially older students and women.

==========Insert Chart 1 approximately here==========

This record of misses points up the complexity of projecting enrollments in higher education. While the average annual growth rate in enrollment for all institutions of higher education was 1.2% between 1977 and 1984, it was 2.2% between 1984 and 1990 (Gerald and Hussar 1991, 11). Does this imply accelerating enrollment increases as the 18-24 year old traditional college age demographic group grows in the "echo" of the baby boom? Or does it primarily reflect increasing enrollment rates? And can those rates be expected to behave similarly in the next decade?

Gerald and Hussar (1991) projected that enrollments in public higher education would

increase by a 1.2% average annual growth rate for public institutions in the period 1990 to 2002. Public four-year institutions are predicted to grow at .9% per year from 1990 to 1996 and at 1.4% per year from 1996 to 2002. These predictions are based on an interactive forecasting model (p. 152) which assumes:

> 1) Age specific enrollment rates for the younger age cohorts of both men and women will increase over the projection period, while those for older men will remain constant with the most recent rates, and those for older women will increase slightly.
>
> 2) Public enrollment as a percent of total enrollment will remain constant at levels consistent with the most recent rates, as will graduate enrollment as a percent of total post baccalaureate enrollment.
>
> 3) For each age group and each attendance status (full- or part-time), enrollment by gender and level enrolled by student and by type of institutions (2- or 4-year) will follow past trends through 2002 (p. 161).

Kaufman (1986) warned that two of the factors which kept enrollments higher than expected in the 1980's might be transitory: enrollment rates for women 25 and older may decline as more women attend college prior to the age of 25, and the enrollment rate of 18 to 24-year olds may decline as higher proportions of college age persons come from groups with traditionally lower college going rates. Gerald and Hussar do not seem to believe that either of these changes will take place.

Clotfelter et al. (1991, 39), on the other hand, predicted almost no increase in total enrollment over the 1988 level for all institutions of higher education by the year 2000, when they applied 1988 enrollment rates to the underlying populations divided into groups based on

gender, age and race. They note that in four-year public institutions, enrollment rates for whites and blacks were very similar, when economic status was held constant (p. 47). Hispanics and other non-white groups have lower enrollment rates in the lowest and second socioeconomic quartile, and hispanics significantly lower rates at the third quartile in this group of institutions. They noted that in the National Center for Education Statistics' High School and Beyond survey, these groups accounted for less than 7% of total high school seniors enrolled in four-year institutions in 1980, while blacks accounted for 9%, and whites for 84% (from Clotfelter et al.; see Table 1 for calculation). WICHE (1991, 4) estimates that by 1995, 72% of high school graduates will be white non-Latino (compared with 78% in 1986), while blacks will remain approximately 13%, and Latinos and other non-white groups approximately 15% (compared with 9% in 1986).

==========Insert Table 1 approximately here==========

A slightly different view can be seen in Table II, where Family Income Quartiles are split by ethnic group. Here it is evident that nearly 70% of those who attended college came from the top two quartiles, while only 30% come from the bottom two. This demonstrates that enrollment rates in four year colleges are strongly related to family income, and that financial aid programs to date have not been successful in providing equal access to students from low income families. From this Clotfelter et al reasoned that, while the number of 18-24 year olds was projected to grow in the 1990's, the growth would be fastest in those groups least likely to enroll in higher education. Indeed, if the bottom 60% of US families experienced a real decline in income in the 1980's, while public higher education tuition was growing at a double digit rate, it seems likely that this disparity in enrollment rates between

the highest and lowest income quartiles will remain even as the number of families in the upper quartiles is dropping. Such a shift could have profound enrollment effects in higher education institutions.

==========Insert Table 2 approximately here==========

Charles Manski (1992) compared this stratification between the class of 1972 and the class of 1980, using data from the NLS-72 and the High School and Beyond surveys. Looking at both enrollment rates and graduation rates, he concluded that the amount of stratification for public four year institutions was largely unchanged between the two studies, and that it was more pronounced for those who graduated with Bachelor's degrees than for those who enrolled (Table 3, Chart 2).

==========Insert Table 3 and Chart 2 approximately here===

The Economic Dimension of Participation Rates

It has proved highly problematic to separate economic effects from other socio/cultural influences that keep lower-income and minority students from enrolling in four-year institutions of higher education. Indirect indicators, however, imply that reducing financial stress can improve enrollment rates. During the 1970's, the real cost of public higher education fell, financial aid increased substantially, and participation rates of minority students rose rapidly (Clotfelter et al 1991). Leslie and Brinkman (1988) and McPherson and Schapiro (1991) both confirmed that enrollment rates go down in predictable amounts when the price of attending higher education rises. While the longer-term effects of price increases on consolidated enrollments seem to have been negligible in the past decade (Daener 1993), the two year sector has maintained a very low price and there has been

considerably more growth there than in the four-year sector of higher education.

St. John (1993) tested the efficacy of various price response models in improving upon the results of a NCES enrollment prediction in the early 1980's. All models including price response factors underestimated enrollments in 1985 by more than the NCES model, which was based on demographic cohorts alone. He suggests that these models work best when applied to already enrolled students, because institutional marketing and other factors seem to influence the enrollment decision more than economic response to tuition and financial aid. Thus, price response appears to be mitigated by numerous other factors, both social and economic.

Economists have long pointed out that the full costs of attending higher education include the opportunity costs or foregone wages of the student while s/he is enrolled. Considering these costs may go a long way toward explaining who enrolls in college and why tuition increases in the last decade do not seem to have affected the numbers of students who enroll. Simply put, opportunity costs are a greater burden to low income students. If one is able to bear these costs, public school tuition is a relatively small addition, and tuition increases are negligible to the great majority of those who can afford to enroll.

Table 4 illustrates the relative weight of opportunity costs and public four-year average tuition. Foregone wages represent over 3 times the cost of tuition, room and board for an average male, and over twice the cost for the average female. By way of illustration, a $100 increase in average tuition costs amounts to a 2.5% increase in tuition, but only a 0.6% (male) or 0.8% (female) increase in total costs.

==========Insert Table 4 approximately here==========

Thus, those who can tolerate the expense of foregone wages are not as sensitive to increases in tuition price as would otherwise be the case. Those who are excluded due to economic circumstances are not primarily affected by the costs of attending, such as tuition, books and living expenses. They are excluded before these costs are even considered by the opportunity costs of not working for the four or more years it will take to complete a degree. Despite human capital theory which holds that the rational person will invest in higher education to the extent that the increased earnings later will cover the costs of attending (including foregone wages) actual student behavior indicates that those foregone wages are an insurmountable barrier to participation for students from low income families.

In this context, it makes sense that students who can bear the costs of not working (which amount to tens of thousands of dollars) are not significantly affected by tuition increases which amount to a few thousand. Once a student accepts the opportunity costs, the actual attendance costs, offset by financial aid and part-time employment, are relatively minor.

This implies that if it is desirable public policy to encourage equal access to higher education from all economic groups, society must be willing to address the largest costs of attending higher education, namely the need for financial survival while enrolled in school. To the extent that college work-study provides for living expenses, it partially addresses this issue. Student financial aid, however, is conceived and executed to cover the costs of attending an institution. For lower income students, many of whom have financial obligations to support their families, institutionally based financial aid is inadequate incentive to give up four years' worth of wages. Social welfare programs to provide support to low

income students and their families may be the only means of providing equal access for all to higher education. This was the conclusion reached by policy makers in Australia, when it was observed that despite a zero tuition policy significant income stratification remained among those attending higher education (Taylor 1991, 194).

If opportunity cost is the main economic factor in determining who attends four year institutions, it argues that tuition policy has less impact on access than was once thought. It also points out a number of particularly difficult problems with the current trend in tuition setting. First, four-year higher education has not been successful in affording equal access to all qualified students, but is already skewed to the economically advantaged. Although this means that most institutions will be able to raise price without losing enrollments, it implies a fundamental failure in the mission of public higher education and invites a further erosion in public funds. Second, if some mechanism for increasing access for lower-income students can be found, it will mean either overall growth in enrollment or exclusion of some students who would otherwise be expected to attend four-year public institutions. Neither case is likely to be accompanied by increases in funds. Third, if the price of public higher education approaches that of private institutions, the most wealthy students will be the most likely to leave the system (preferring the higher prestige afforded by private schools at marginally higher cost), also leading to a drain in funds. Finally, the assumption made by the advocates of high tuition/high aid overlooks the very real possibility that the extra funds generated will lead to extra reduction in state support (particularly given the failure to provide equal access to lower income students), leaving the institution with no additional funds and much higher demands for service from students who are paying higher prices.

These problems indicate that tuition policy is unlikely to be the panacea to the very real pressure on higher education to fundamentally restructure its costs as the 21st century approaches.

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Chart 1

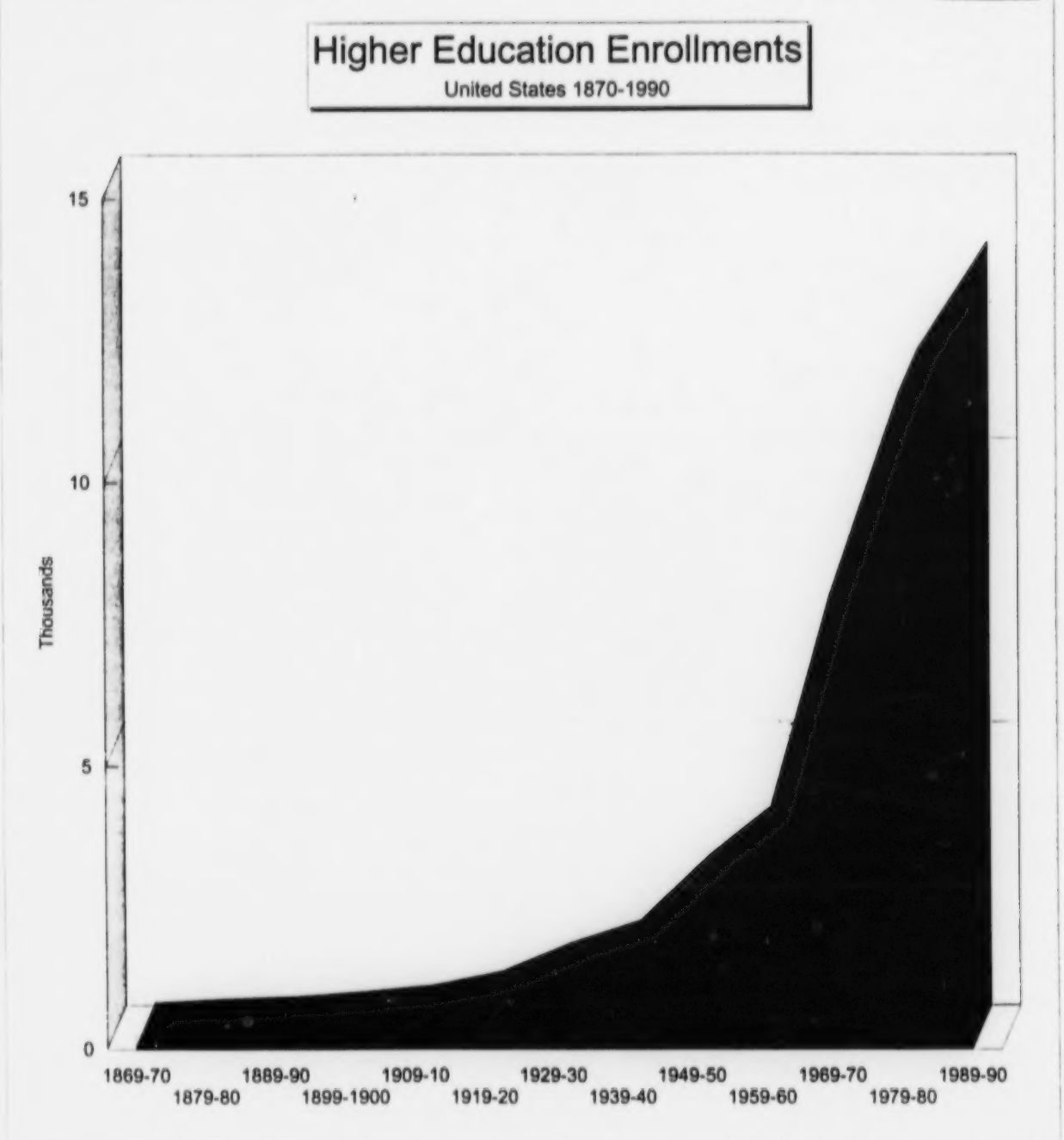
Higher Education Enrollments
United States 1870-1990
Thousands
15
10
5
0
1869-70
1879-80
1889-90
1899-1900
1909-10
1919-20
1929-30
1939-40
1949-50
1959-60
1969-70
1979-80
1989-90

Table 1. Percent of High School Graduates Enrolled In Four-Year Public Higher Education by Ethnic Group and Family Income Quartile.

Ethnic Group/ Family Income Quartile	Percent in 4yr Public Insts.	Percent of HS Seniors	Percent of HS Seniors Enrolled in 4yr Public Instit.	Group Total	Percent of 4yr Public Enroll.
Hispanic:					
Lowest	6.00%	4.40%	0.26%		
Second	9.00%	2.20%	0.20%		
Third	8.00%	1.70%	0.14%		
Highest	24.00%	1.00%	0.24%	0.84%	4.48%
Other:					
Lowest	6.00%	0.60%	0.04%		
Second	7.00%	0.50%	0.04%		
Third	24.00%	0.60%	0.14%		
Highest	40.00%	0.60%	0.24%	0.46%	2.43%
Black:					
Lowest	13.00%	5.30%	0.69%		
Second	16.00%	2.30%	0.37%		
Third	23.00%	1.60%	0.37%		
Highest	26.00%	1.00%	0.26%	1.68%	9.01%
White:					
Lowest	9.00%	14.60%	1.31%		
Second	14.00%	20.10%	2.81%		
Third	22.00%	21.40%	4.71%		
Highest	31.00%	22.20%	6.88%	15.72%	84.07%
Total Fraction of HS Grads Enrolled				18.70%	

Table 2. Percent of High School Seniors Enrolled in Four Year Public Higher Education by Family Income Quartile and Ethnic Group.

Family Income Quartile/ Ethnic Gr.	Percent in 4yr Public Insts.	Percent of HS Seniors	Percent of HS Seniors Enrolled in 4yr Public Instit.	Group Total	Percent of 4yr Public Enroll.
Lowest					
Hispanic	6.00%	4.40%	0.26%		
Other	6.00%	0.60%	0.04%		
Black	13.00%	5.30%	0.69%		
White	9.00%	14.60%	1.31%	2.30%	12.32%
Second					
Hispanic	9.00%	2.20%	0.20%		
Other	7.00%	0.50%	0.04%		
Black	16.00%	2.30%	0.37%		
White	14.00%	20.10%	2.81%	3.42%	18.27%
Third					
Hispanic	8.00%	1.70%	0.14%		
Other	24.00%	0.60%	0.14%		
Black	23.00%	1.60%	0.37%		
White	22.00%	21.40%	4.71%	5.36%	28.65%
Highest					
Hispanic	24.00%	1.00%	0.24%		
Other	40.00%	0.60%	0.24%		
Black	26.00%	1.00%	0.26%		
White	31.00%	22.20%	6.88%	7.62%	40.77%
Total Fraction of H.S. Gr. Enrolled				18.70%	

Table 3. Distribution of College Enrollment Status for the High School Classes of 1972 and 1980

Family Income Quintile	Class of 1972		Class of 1980	
	Enrolled	Bachelor's Degrees after 5 Years	Enrolled	Bachelor's Degrees after 5 Years
Highest	34%	24%	32%	22%
Fourth	30%	20%	30%	19%
Middle	22%	15%	25%	16%
Second	20%	12%	18%	10%
Lowest	15%	8%	17%	9%

Chart 2

Enrollments and Bachelor's Degrees by Income Quintile

Four Year Public Higher Education

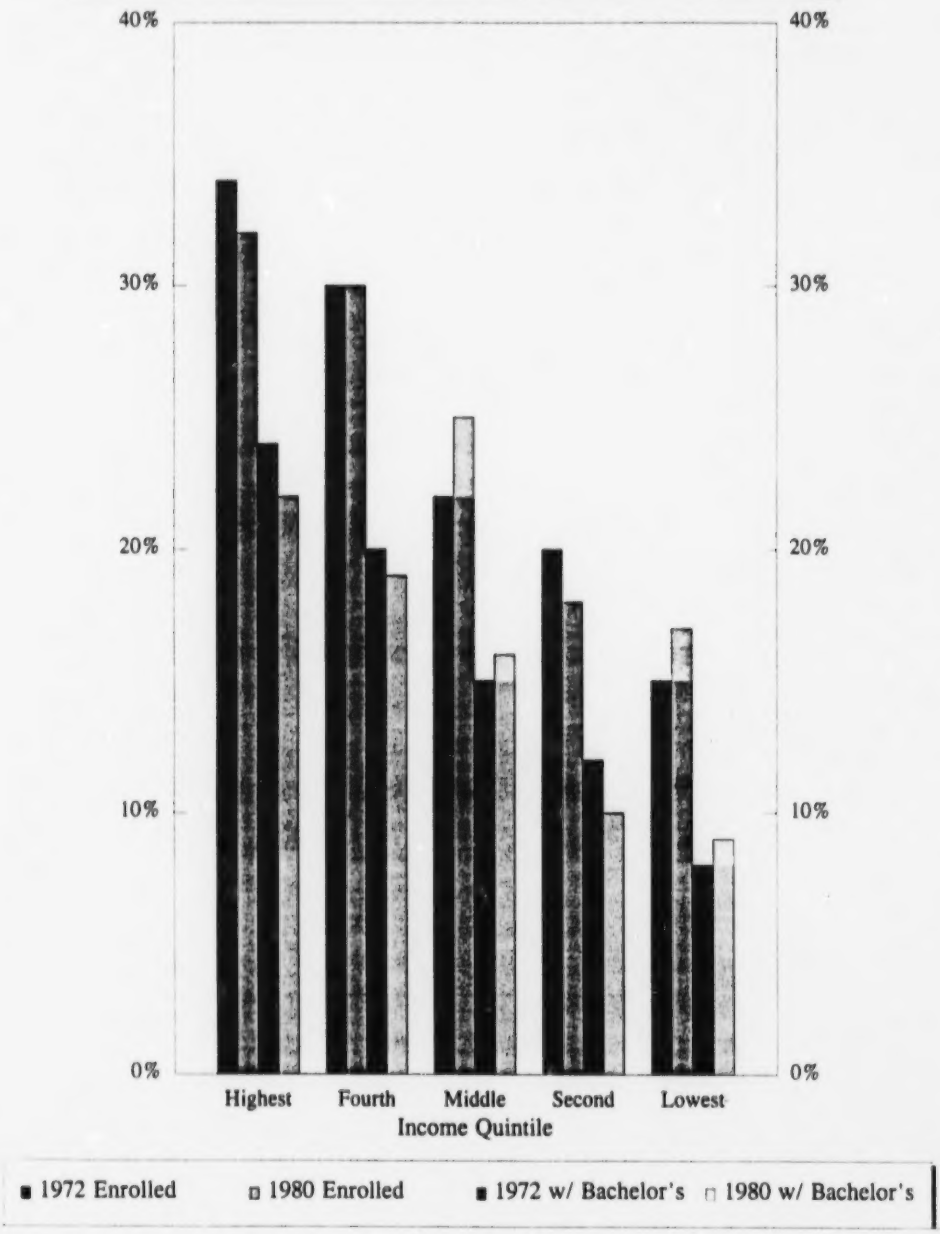

Table 4. The Economic Cost of Higher Education.

	1974-75	1979-80	1984-85	1987-88
Public Tuition, Room and Board	$3,426	$3,156	$3,868	$4,060
Foregone Earnings				
Male	$14,937	$13,619	$12,909	$12,957
Female	$9,011	$8,677	$9,077	$9,128
Ratio: Earnings/Cost				
Male	4.4	4.3	3.3	3.2
Female	2.6	2.7	2.3	2.2
$100/Cost	2.9%	3.2%	2.6%	2.5%
$100/Earnings				
Male	0.7%	0.7%	0.8%	0.8%
Female	1.1%	1.2%	1.1%	1.1%
$100/Cost+Earnings				
Male	0.5%	0.6%	0.6%	0.6%
Female	0.8%	0.8%	0.8%	0.8%

From Clotfelter 1991,46.